

BE Semester- __VI__ (BIOMEDICAL ENGINEERING) Question Bank

(Therapeutic Instrumentation)

All questions carry equal marks (10 marks)

Q.1	Explain briefly the need of anaesthesia. Name at least 5 anaesthetic agents used in medicine.
Q.2	What do you understand by unidirectional non-breathing valve? What is the purpose of interlocks in vaporizers?
Q.3	Explain the components of an Anaesthesia machine & patient breathing circuit along with the schematic diagram.
Q.4	Define the following terms: (a) Absolute Humidity, (b) Relative Humidity, (c) Controlled Ventilation, (d) General Anaesthesia, (e) Local Anaesthesia
Q.5	Explain the complete schematic of anaesthesia machine.
Q.6	Explain the various safety mechanisms in anaesthesia machine. Explain how depth of anaesthesia is measured and monitored?
Q.7	Explain delivery system in terms of anaesthesia machine and humidification.
Q.8	Explain the various types of electro-surgery techniques commonly practiced. What do you understand by Mono-polar & Bi-polar techniques in Electro-Surgery?
Q.9	Explain in detail the safety aspects in Electro-Surgical Unit.
Q.10	Write short note on Electrotomy, fulguration, coagulation, dessication.
Q.11	What do you mean by fibrillation? Explain the process of defibrillation. What are the different conditions that result in ventricular fibrillation?
Q.12	What is the need of synchronizer in DC Defibrillators? Explain along with its circuit diagram.
Q.13	Write down the places where you would find defibrillators & also name which type of defibrillator will be there? What is cardioversion?
Q.14	(a) For Given data: $R_{chest}=90\ \text{Ohms}$, $R_{load}=100\text{Ohms}$, total energy stored in Capacitor $E= 350\text{J}$, Capacitance $C= 60\mu\text{F}$. Calculate the time taken to deliver 70% of energy to the heart. (b) Given data: Resistance $R=70\text{Ohms}$, Time $T=7\text{mSec}$, Energy dissipated $E=80\text{J}$. Calculate Current I .
Q.15	Explain the principle of haemodialysis and the various types of haemodialysers.

Q.16	Define the following: (a) Clearance, (b) Dialysance, (c) Pyrogenicity, (d) Priming volume, (e) Leakage rate
Q.17	What do you mean by GFR? Give its range. What do you understand by ultrafiltration? Explain ultrafiltration monitor.
Q.18	What is peritoneal dialysis? Explain in detail with figure. Discuss the various problems faced with peritoneal dialysis.
Q.19	Explain dialysate temperature control & measurement in detail.
Q.20	Write a short note on portable kidney machine.
Q.21	Explain short wave diathermy along with circuit diagram.
Q.22	Explain in detail spinal cord stimulation and cerebral stimulations.
Q.23	What are the variables that control the dosage in ultrasound therapy unit? Explain the current waveforms used in electrodiagnosis & electrotherapy.
Q.24	Give comparisons between the capacitor plate method & inductive method of short wave diathermy.
Q.25	What do you mean by coherence? Explain the main elements of LASER. Explain the Bio-effects of LASER.
Q.26	What are the two types of emission in LASER? Explain them in detail with diagram.
Q.27	Explain Pulsed Ruby LASER in detail along with its Biomedical Application. Explain in detail the Ocular applications of LASER.
Q.28	Explain ND YAG LASER in detail along with its Biomedical Application. Explain in detail the Cancer Diagnosis applications of LASER.
Q.29	Explain CO ₂ LASER in detail along with its Biomedical Application. Explain in detail the Optical Tomography application of LASER.
Q.30	On what factors do LASER properties depend? Explain them. What do you mean by Q-Switching?
Q.31	Write short note on pumping mechanism and resonator design.
Q.32	Write short note on apnea detection and incubator.
Q.33	Discuss about Heart lung machine with diagram.
Q.34	What is stents? Explain in detail balloon angiography.

Q.35	Explain in detail phototherapy devices for neonatal care.
Q.36	Write short note on hollow fiber haemodialyser and artificial kidney.
Q.37	Explain the working principle of implantable defibrillator in detail with diagram.
Q.38	Write short note on safety aspects like burns, high frequency current hazard, and explosion hazard.
Q.39	Write short note on Performance analysis of dialysers, membranes used for hemodialysis.
Q.40	Explain in detail Applications of laser in medicine: control of gastric hemorrhage by photocoagulation.